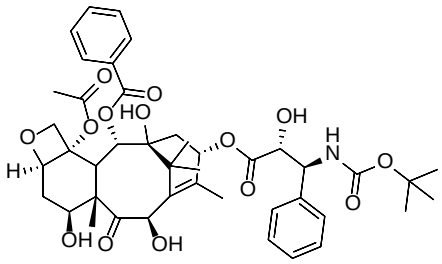
Product data sheet

MedKoo Cat#: 100270 Name: Docetaxel CAS#: 114977-28-5 (anhydrous) Chemical Formula: $C_{43}H_{53}NO_{14}$ Exact Mass: 807.3466 Molecular Weight: 807.80	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:

Docetaxel, also known as RP-56976, is a semi-synthetic, second-generation taxane derived from a compound found in the European yew tree Taxus baccata. Docetaxel displays potent and broad antineoplastic properties; it binds to and stabilizes tubulin, thereby inhibiting microtubule disassembly which results in cell- cycle arrest at the G2/M phase and cell death. This agent also inhibits pro-angiogenic factors such as vascular endothelial growth factor (VEGF) and displays immunomodulatory and pro-inflammatory properties by inducing various mediators of the inflammatory response. Docetaxel has been studied for use as a radiation-sensitizing agent.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	55.20	68.33
Ethanol	60.76	75.22
DMF	5.0	6.20
DMSO:PBS (pH 7.2) (1:10)	0.10	0.12

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	1.24 mL	6.19 mL	12.38 mL
5 mM	0.25 mL	1.24 mL	2.48 mL
10 mM	0.12 mL	0.62 mL	1.24 mL
50 mM	0.02 mL	0.12 mL	0.25 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Wang YJ, Wang J, Hao DL, Yue QX, Xie R, DE GJ, Yi H, Zang C, Zhao QH, Chen YJ. [Preparation of docetaxel-loaded nanomicelles and their anti-Lewis lung cancer effect in vitro]. Zhongguo Zhong Yao Za Zhi. 2019 Jun;44(11):2251-2259. Chinese. doi: 10.19540/j.cnki.cjcmm.20190326.305. PMID: 31359650.

In vivo study

1. Kim CH, Kang TH, Kim BD, Lee TH, Yoon HY, Goo YT, Choi YS, Kang MJ, Choi YW. Enhanced docetaxel delivery using sterically stabilized RIPL peptide-conjugated nanostructured lipid carriers: In vitro and in vivo antitumor efficacy against SKOV3 ovarian cancer cells. Int J Pharm. 2020 Jun 15;583:119393. doi: 10.1016/j.ijpharm.2020.119393. Epub 2020 May 4. PMID: 32376445.

7. Bioactivity

Product data sheet

Biological target: Docetaxel (RP-56976) is a microtubule depolymerization inhibitor with an IC50 of 0.2 μM.

In vitro activity

Docetaxel-loaded nanomicelles were prepared in this study to improve the solubility and tumor targeting effect of docetaxel(DTX),and further evaluate their anticancer effects in vitro. PBAE-DTX nanomicelles were prepared by film-hydration method with amphiphilic block copolymer polyethyleneglycol methoxy-polylactide(PELA) and pH sensitive triblock copolymer polyethyleneglycol methoxy-polylactide-poly-β-aminoester(PBAE) were used respectively to prepare PELA-DTX nanomicelles and PBAE-DTX nanomicelles. The nanomicelles were characterized by physicochemical properties and the activity of mice Lewis lung cancer cells was studied. The DTX micelles also showed significant inhibitory effects on Lewis lung cancer cells by MTT assay, and pH-sensitive PBAE-DTX showed better cytotoxicity. The results of flow cytometry indicated that,the apoptosis rate of lung cancer Lewis cells was(20.72±1.47)%,(29.71±2.38)%,and(40.91±1.90)%($P<0.05$) at 48 h after treatment in DTX,PELA-DTX,and PBAE-DTX groups. The results showed that different docetaxel preparations could promote the apoptosis of Lewis cells, and PBAE-DTX had stronger apoptotic-promoting effect. The pH-sensitive DTX-loaded micelles are promising candidates in developing stimuli triggered drug delivery systems in acidic tumor micro-environments with improved inhibitory effects of tumor growth on Lewis lung cancer.

Reference: Zhongguo Zhong Yao Za Zhi. 2019 Jun;44(11):2251-2259. https://pubmed.ncbi.nlm.nih.gov/31359650/

In vivo activity

Docetaxel (DTX) has poor solubility, low specificity, and severe side effects. For efficient targeting of DTX to hepsin-overexpressing SKOV3 ovarian cancer cells, PEGylated and RIPL peptide (IPLVVPLRRRRRRRRC)-conjugated nanostructured lipid carriers (PEG-RIPL-NLCs) were examined for in vivo antitumor efficacy. Experiments in male Sprague-Dawley rats revealed that DTX-PEG-RIPL-NLCs increased the mean residence time of DTX but reduced total body clearance and volume of distribution. In a SKOV3-bearing xenograft Balb/c athymic mouse model, DTX-PEG-RIPL-NLCs suppressed tumors, evidenced by tumor volume change and histopathological examination. Thus, it can be concluded that PEG-RIPL-NLCs have an advantage of high payload of poorly water-soluble drugs and are a good candidate for drug targeting to SKOV3-derived ovarian cancer.

Reference: Int J Pharm. 2020 Jun 15;583:119393.
https://www.sciencedirect.com/science/article/abs/pii/S037851732030377X?via%3Dihub

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.