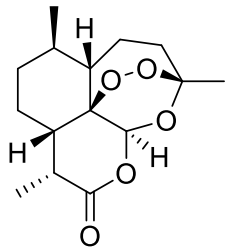
Product data sheet

MedKoo Cat#: 317131 Name: Artemisinin CAS#: 63968-64-9 Chemical Formula: $C_{15}H_{22}O_5$ Exact Mass: 282.14672 Molecular Weight: 282.34	
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:

Artemisinin, also known as qinghaosu (Chinese: 青蒿素), and its semi-synthetic derivatives are a group of drugs that possess the most rapid action of all current drugs against Plasmodium falciparum malaria. It was discovered by Tu Youyou, a Chinese scientist, who was awarded half of the 2015 Nobel Prize in Medicine for her discovery. Treatments containing an artemisinin derivative (artemisinin-combination therapies, ACTs) are now standard treatment worldwide for P. falciparum malaria. Artemisinin is isolated from the plant Artemisia annua, sweet wormwood, an herb employed in Chinese traditional medicine. A precursor compound can be produced using genetically engineered yeast. Chemically, artemisinin is a sesquiterpene lactone containing an unusual peroxide bridge. This peroxide is believed to be responsible for the drug's mechanism of action. Few other natural compounds with such a peroxide bridge are known. The drug is also increasingly being used in Plasmodium vivax malaria, as well as being a topic of research in cancer treatment.

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	36.31	128.60
DMF	20.0	70.84
DMF:PBS (pH 7.2) (1:1)	0.5	1.77
Ethanol	20.39	72.22

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	3.54 mL	17.71 mL	35.42 mL
5 mM	0.71 mL	3.54 mL	7.08 mL
10 mM	0.35 mL	1.77 mL	3.54 mL
50 mM	0.07 mL	0.35 mL	0.71 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. Zhang W, Xiong L, Chen J, Tian Z, Liu J, Chen F, Ren M, Guan W, Zhang S. Artemisinin Protects Porcine Mammary Epithelial Cells against Lipopolysaccharide-Induced Inflammatory Injury by Regulating the NF-κB and MAPK Signaling Pathways. Animals (Basel). 2021 May 24;11(6):1528. doi: 10.3390/ani11061528. PMID: 34073895; PMCID: PMC8225056.
2. Hu HM, Mao MH, Hu YH, Zhou XC, Li S, Chen CF, Li CN, Yuan QL, Li W. Artemisinin protects DPSC from hypoxia and TNF-α mediated osteogenesis impairments through CA9 and Wnt signaling pathway. Life Sci. 2021 Jul 15;277:119471. doi: 10.1016/j.lfs.2021.119471. Epub 2021 Mar 31. PMID: 33811898.

Product data sheet

In vivo study

1. Lin SP, Wei JX, Hu JS, Bu JY, Zhu LD, Li Q, Liao HJ, Lin PY, Ye S, Chen SQ, Chen XH. Artemisinin improves neurocognitive deficits associated with sepsis by activating the AMPK axis in microglia. Acta Pharmacol Sin. 2021 Jul;42(7):1069-1079. doi: 10.1038/s41401-021-00634-3. Epub 2021 Mar 23. PMID: 33758353; PMCID: PMC8209200.
2. Yang Z, Han F, Liao T, Zheng H, Luo Z, Ma M, He J, Li L, Ye Y, Zhang R, Huang Z, Zhang Y, Sun Q. Artemisinin Attenuates Transplant Rejection by Inhibiting Multiple Lymphocytes and Prolongs Cardiac Allograft Survival. Front Immunol. 2021 Feb 24;12:634368. doi: 10.3389/fimmu.2021.634368. PMID: 33717174; PMCID: PMC7943449.

7. Bioactivity

Biological target:

Artemisinin inhibits AKT signaling pathway by decreasing pAKT in a dose-dependent manner.

In vitro activity

As shown in Figure 2, low concentrations of artemisinin promoted cell growth and induced cell death in a concentration-dependent manner at higher concentrations. Maximum cell viability significantly increased ($p < 0.05$) when pMECs were treated with 20 μM artemisinin for 12 h. According to these results, 20 μM artemisinin (treated with 12 h) was chosen to examine the protective effects of artemisinin against inflammatory injury in LPS-induced pMECs.

Reference: Animals (Basel). 2021 Jun; 11(6): 1528. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8225056/

In vivo activity

Recipients treated with ART (Artemisinin) had longer graft survival than controls (17.33 ± 4.89 vs 6.83 ± 0.75 days); approximately 66% of grafts in the ART rat group survived over 2 weeks, while survival time of grafts were less than 8 day in the control group (Figure 1A). Subsequently, allografts were harvested on day 5 after cardiac transplantation. As shown by representative H&E photomicrographs, the rejection area of the ART group was noticeably thinner than that of the control group. Interstitial vasculitis, hemorrhage, and edema were evident in the control group, which were significantly diminished by ART treatment (Figure 1B). Moreover, TUNEL staining revealed apoptotic cells (red) in the ART group were significantly less than that in the control group, especially in the rejection area. DAPI staining (blue) indicated that nuclei in the control group were deformed and broken, which indicated that more cells were in a state of apoptosis. Together, these data indicate that ART reduced rejection and protected cardiomyocytes (Figure 1C).

Reference: Front Immunol. 2021; 12: 634368. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7943449/