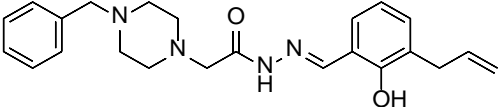


# Product data sheet



MedKoo Cat#: 205932 Name: PAC-1 CAS: 315183-21-2 Chemical Formula: C <sub>23</sub> H <sub>28</sub> N <sub>4</sub> O <sub>2</sub> Exact Mass: 392.2212 Molecular Weight: 392.503	
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:

PAC-1 is known as VO-100 and procaspase activating compound-1; which selectively induces apoptosis, or cell suicide, in cancerous cells. PAC-1 has shown good results in mouse models and is being further evaluated for use in humans. In 2010 a published study showed PAC-1 to be safe to research dogs, and a second study published later that same year reported that a PAC-1 derivative (called S-PAC-1) was well tolerated in a small Phase I Clinical Trial of pet dogs with lymphoma. Even at low doses of S-PAC-1, tumors regressed in 1/6 dogs, and the disease was stabilized (no additional tumor growth) in 3/6 dogs.

## 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
DMF	20.0	50.96
DMSO	46.81	119.27
DMSO:PBS (pH 7.2) (1:3)	0.25	0.64
Ethanol	41.5	105.73

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.55 mL	12.74 mL	25.48 mL
5 mM	0.51 mL	2.55 mL	5.10 mL
10 mM	0.26 mL	1.27 mL	2.55 mL
50 mM	0.05 mL	0.26 mL	0.51 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

- Seervi M, Sobhan PK, Joseph J, Ann Mathew K, Santhoshkumar TR. ERO1 $\alpha$ -dependent endoplasmic reticulum-mitochondrial calcium flux contributes to ER stress and mitochondrial permeabilization by procaspase-activating compound-1 (PAC-1). *Cell Death Dis.* 2013 Dec 19;4(12):e968. doi: 10.1038/cddis.2013.502. PMID: 24357799; PMCID: PMC3877569.
- Peterson QP, Goode DR, West DC, Ramsey KN, Lee JJ, Hergenrother PJ. PAC-1 activates procaspase-3 in vitro through relief of zinc-mediated inhibition. *J Mol Biol.* 2009 Apr 24;388(1):144-58. doi: 10.1016/j.jmb.2009.03.003. Epub 2009 Mar 10. PMID: 19281821; PMCID: PMC2714579.

### In vivo study

# Product data sheet



1. Wang F, Wang L, Li Y, Wang N, Wang Y, Cao Q, Gong P, Yang J, Wu C. PAC-1 and its derivative WF-210 Inhibit Angiogenesis by inhibiting VEGF/VEGFR pathway. *Eur J Pharmacol.* 2018 Feb 15;821:29-38. doi: 10.1016/j.ejphar.2017.12.035. Epub 2017 Dec 19. PMID: 29269017.
2. Putt KS, Chen GW, Pearson JM, Sandhorst JS, Hoagland MS, Kwon JT, Hwang SK, Jin H, Churchwell MI, Cho MH, Doerge DR, Helferich WG, Hergenrother PJ. Small-molecule activation of procaspase-3 to caspase-3 as a personalized anticancer strategy. *Nat Chem Biol.* 2006 Oct;2(10):543-50. doi: 10.1038/nchembio814. Epub 2006 Aug 27. PMID: 16936720.

## 7. Bioactivity

### Biological target:

PAC-1 is a procaspase-3 activator that induces apoptosis in cancer cells with an EC<sub>50</sub> of 2.08 μM.

### In vitro activity

PAC-1 treatment upregulated Ero1 $\alpha$  in multiple cell lines, whereas silencing of Ero1 $\alpha$  significantly inhibited calcium release from ER and cell death. Upregulation of GRP78 and splicing of X-box-binding protein 1 (XBP1) mRNA in multiple cancer cells suggested ER stress as the general event triggered by PAC-1. XBP1 mRNA splicing and GRP78 upregulation confirmed ER stress even in Bax/Bak double knockout and PAC-1-resistant Apaf-1-knockout cells, indicating an induction of ER stress-mediated mitochondrial apoptosis by PAC-1.

Reference: *Cell Death Dis.* 2013 Dec 19;4(12):e968. <https://pubmed.ncbi.nlm.nih.gov/24357799/>

### In vivo activity

PAC-1 and WF-210 abrogated VEGF-induced vessel sprouting from rat aortic rings and inhibited vascular formation in the Matrigel plug assay. PAC-1 and WF-210 suppressed phosphorylation of VEGFR2 and its downstream protein kinases c-Src, FAK, and AKT in both HUVECs and U-87 cells. When given to mice bearing subcutaneous or orthotopic xenograft, PAC-1 and WF-210 inhibited the tumor growth and tumor angiogenesis. Further tests showed that PAC-1 and WF-210 inhibited stemness and induced autophagy flux of U-87 cells.

Reference: *Eur J Pharmacol.* 2018 Feb 15;821:29-38. <https://pubmed.ncbi.nlm.nih.gov/29269017/>

*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.*