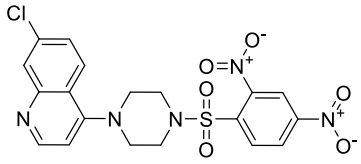
Product data sheet

MedKoo Cat#: 407205 Name: VR23 CAS#: 1624602-30-7 Chemical Formula: $C_{19}H_{16}ClN_5O_6S$ Exact Mass: 477.05098 Molecular Weight: 477.876	
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:

VR23 is a potent and selective inhibitor of trypsin-like proteasomes (IC50 = 1 nmol/L), chymotrypsin-like proteasomes (IC50 = 50-100 nmol/L), and caspase-like proteasomes (IC50 = 3 μmol/L). The primary molecular target of VR23 was β2 of the 20S proteasome catalytic subunit. Notably, VR23 was structurally distinct from other known proteasome inhibitors and selectively killed cancer cells by apoptosis, with little effect on noncancerous cells. VR23 was effective in vivo in controlling multiple myelomas and metastatic breast cancer cells, in the latter case also enhancing the antitumor activity of paclitaxel while reducing its side effects.

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	21.61	45.22
DMF	2.0	4.19
DMF:PBS (pH 7.2) (1:2)	0.3	0.63
Water	5.0	10.46

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.09 mL	10.46 mL	20.93 mL
5 mM	0.42 mL	2.09 mL	4.19 mL
10 mM	0.21 mL	1.05 mL	2.09 mL
50 mM	0.04 mL	0.21 mL	0.42 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. Durkin A, Vu HY, Lee H. The VR23 Antitumor Compound Also Shows Strong Anti-Inflammatory Effects in a Human Rheumatoid Arthritis Cell Model and Acute Lung Inflammation in Mice. J Immunol. 2020 Feb 15;204(4):788-795. doi: 10.4049/jimmunol.1900531. Epub 2020 Jan 8. PMID: 31915262.
2. Pundir S, Vu HY, Solomon VR, McClure R, Lee H. VR23: A Quinoline-Sulfonyl Hybrid Proteasome Inhibitor That Selectively Kills Cancer via Cyclin E-Mediated Centrosome Amplification. Cancer Res. 2015 Oct 1;75(19):4164-75. doi: 10.1158/0008-5472.CAN-14-3370. Epub 2015 Aug 3. PMID: 26238784.

In vivo study

Product data sheet

1. Durkin A, Vu HY, Lee H. The VR23 Antitumor Compound Also Shows Strong Anti-Inflammatory Effects in a Human Rheumatoid Arthritis Cell Model and Acute Lung Inflammation in Mice. J Immunol. 2020 Feb 15;204(4):788-795. doi: 10.4049/jimmunol.1900531. Epub 2020 Jan 8. PMID: 31915262.
2. Pundir S, Vu HY, Solomon VR, McClure R, Lee H. VR23: A Quinoline-Sulfonyl Hybrid Proteasome Inhibitor That Selectively Kills Cancer via Cyclin E-Mediated Centrosome Amplification. Cancer Res. 2015 Oct 1;75(19):4164-75. doi: 10.1158/0008-5472.CAN-14-3370. Epub 2015 Aug 3. PMID: 26238784.

7. Bioactivity

Biological target:

VR23 inhibits the activities of trypsin-like proteasomes (IC50=1 nM), chymotrypsin-like proteasomes (IC50=50-100 nM), and caspase-like proteasomes (IC50=3 μM).

In vitro activity

A clonogenic assay showed that very few MCF7 cells survived for 2 weeks at 1.5 μmol/L of VR23 (Supplementary Fig. S1A). Data from flow cytometry showed that the treatment of MCF7 with 2.7or 8.0 μmol/L of VR23 resulted in 23.7% or 38.1% sub-G1 DNA content within 48 hours after treatment, respectively (Supplementary Fig. S1B). In contrast, the flow cytometry profiles of MCF10A cells were not notably different between the sham control and VR23-treated samples, up to 8 μmol/L and 72 hours after treatment (Supplementary Fig. S1C). These data demonstrate that, unlike MCF7, the noncancer MCF10A is much more resistant to VR23, which is consistent with data shown in Fig. 1C.

Reference: Cancer Res. 2015 Oct 1;75(19):4164-75. https://cancerres.aacrjournals.org/content/75/19/4164.long

In vivo activity

To determine the anti-inflammatory effects of VR23, the level of TNF-α in the BALF was measured 24 h after the mouse was treated with 0.4 mg of LPS. This study found that VR23 effectively reduces the level of TNF-α (Fig. 4A). Furthermore, VR23 at 30 mg per kilogram of body weight completely inhibited cell invasion into the bronchoalveolar space (Fig. 4B). LPS-induced lung injury can lead to lung tissue inflammation due to the influx of immune cells into the alveolar space. To gain insight into this aspect, this studyexamined the effects of VR23 on lung tissue sections stained with H&E. The resultant histopathological data show that alveolar inflammation caused by LPS is largely prevented when animals are treated with 30 mg/kg VR23 (Fig. 4D). DEX treatment also showed a similar result (Fig. 4D). This suggests that the anti-inflammatory activities of VR23 observed in the cell culture system can be translated into a preclinical model.

Reference: J Immunol. 2020 Feb 15;204(4):788-795. https://www.jimmunol.org/content/204/4/788.long

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.