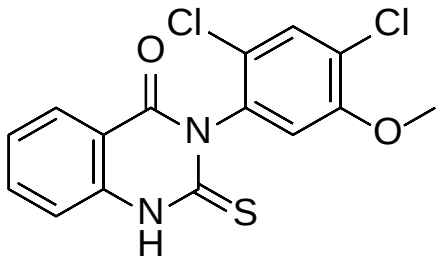
Product data sheet

MedKoo Cat#: 522436 Name: Mdivi-1 CAS: 338967-87-6 Chemical Formula: $C_{15}H_{10}Cl_2N_2O_2S$ Exact Mass: 351.984 Molecular Weight: 353.217	
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:
Mdivi-1 is a selective cell-permeable inhibitor of mitochondrial division dynamin-related GTPase (DRP1) and mitochondrial division dynamin I (Dnm1). Mdivi-1 inhibits apoptosis by inhibiting mitochondrial outer membrane permeabilization. Mdivi-1 is the first selective inhibitor of mitochondrial division dynamins. Mdivi-1 represents a class of therapeutics for stroke, myocardial infarction, and neurodegenerative diseases.

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	56.62
DMSO	71.58	202.65
DMSO:PBS (pH 7.2) (1:6)	0.1	0.28

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.83 mL	14.16 mL	28.31 mL
5 mM	0.57 mL	2.83 mL	5.66 mL
10 mM	0.28 mL	1.42 mL	2.83 mL
50 mM	0.06 mL	0.28 mL	0.57 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. Ruiz A, Alberdi E, Matute C. Mitochondrial Division Inhibitor 1 (mdivi-1) Protects Neurons against Excitotoxicity through the Modulation of Mitochondrial Function and Intracellular Ca2+ Signaling. Front Mol Neurosci. 2018 Jan 17;11:3. doi: 10.3389/fnmol.2018.00003. PMID: 29386996; PMCID: PMC5776080.
2. Cassidy-Stone A, Chipuk JE, Ingerman E, Song C, Yoo C, Kuwana T, Kurth MJ, Shaw JT, Hinshaw JE, Green DR, Nunnari J. Chemical inhibition of the mitochondrial division dynamin reveals its role in Bax/Bak-dependent mitochondrial outer membrane permeabilization. Dev Cell. 2008 Feb;14(2):193-204. doi: 10.1016/j.devcel.2007.11.019. PMID: 18267088; PMCID: PMC2267902.

In vivo study

1. Manczak M, Reddy PH. Mitochondrial division inhibitor 1 protects against mutant huntingtin-induced abnormal mitochondrial dynamics and neuronal damage in Huntington's disease. Hum Mol Genet. 2015 Dec 20;24(25):7308-25. doi: 10.1093/hmg/ddv429. Epub 2015 Oct 12. PMID: 26464486; PMCID: PMC4664169.

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2. Park SW, Kim KY, Lindsey JD, Dai Y, Heo H, Nguyen DH, Ellisman MH, Weinreb RN, Ju WK. A selective inhibitor of drp1, mdivi-1, increases retinal ganglion cell survival in acute ischemic mouse retina. Invest Ophthalmol Vis Sci. 2011 Apr 27;52(5):2837-43. doi: 10.1167/iovs.09-5010. PMID: 21372007; PMCID: PMC3088566.

7. Bioactivity

Biological target:

Mdivi-1 is a selective dynamin-related protein 1 (Drp1) inhibitor.

In vitro activity

Time-lapse fluorescence microscopy revealed that mdivi-1 blocked NMDA-induced mitochondrial fission but not that triggered by sustained AMPA receptor activation, showing that mdivi-1 inhibits excitotoxic mitochondrial fragmentation in a source specific manner. Similarly, mdivi-1 strongly reduced NMDA-triggered necrotic-like neuronal death and, to a lesser extent, AMPA-induced toxicity. Interestingly, neuroprotection provided by mdivi-1 against NMDA, but not AMPA, correlated with a reduction in cytosolic Ca^{2+} ($[Ca^{2+}]_{cyt}$) overload and calpain activation indicating additional cytoprotective mechanisms.

Reference: Front Mol Neurosci. 2018 Jan 17;11:3. https://pubmed.ncbi.nlm.nih.gov/29386996/

In vivo activity

C57BL/6 mice received injections of mdivi-1 (50 mg/kg) or vehicle, and then transient retinal ischemia was induced by acute IOP elevation. Drp1 and GFAP protein expression was significantly increased in the early neurodegenerative events (within 12 hours) of ischemic mouse retina. Mdivi-1 treatment blocked apoptotic cell death in ischemic retina, and significantly increased RGC survival at 2 weeks after ischemia.

Reference: Invest Ophthalmol Vis Sci. 2011 Apr 27;52(5):2837-43. https://pubmed.ncbi.nlm.nih.gov/21372007/

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.