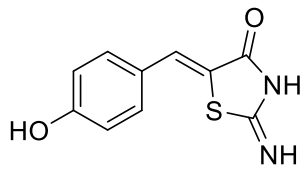
Product data sheet

MedKoo Cat#: 407310 Name: Mirin CAS#: 1198097-97-0 Chemical Formula: $C_{10}H_8N_2O_2$ Exact Mass: 220.0306 Molecular Weight: 220.246	
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:
Mirin is a Mre11-Rad50-Nbs1 (MRN)-ATM pathway inhibitor.

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	31.76	144.18
DMF	30.0	136.21
Ethanol	0.25	1.14

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.54 mL	22.70 mL	45.40 mL
5 mM	0.91 mL	4.54 mL	9.08 mL
10 mM	0.45 mL	2.27 mL	4.54 mL
50 mM	0.09 mL	0.45 mL	0.91 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. Jividen K, Kedzierska KZ, Yang CS, Szlachta K, Ratan A, Paschal BM. Genomic analysis of DNA repair genes and androgen signaling in prostate cancer. BMC Cancer. 2018 Oct 10;18(1):960. doi: 10.1186/s12885-018-4848-x. PMID: 30305041; PMCID: PMC6180441.
2. Petroni M, Sardina F, Infante P, Bartolazzi A, Locatelli E, Fabretti F, Di Giulio S, Capalbo C, Cardinali B, Coppa A, Tessitore A, Colicchia V, Sahùn Roncero M, Belardinilli F, Di Marcotullio L, Soddu S, Comes Franchini M, Petricci E, Gulino A, Giannini G. MRE11 inhibition highlights a replication stress-dependent vulnerability of MYCN-driven tumors. Cell Death Dis. 2018 Aug 30;9(9):895. doi: 10.1038/s41419-018-0924-z. PMID: 30166519; PMCID: PMC6117286.

In vivo study

1. Mayer A, Baran V, Sakakibara Y, Brzakova A, Ferencova I, Motlik J, Kitajima TS, Schultz RM, Solc P. DNA damage response during mouse oocyte maturation. Cell Cycle. 2016;15(4):546-58. doi: 10.1080/15384101.2015.1128592. Epub 2016 Jan 8. PMID: 26745237; PMCID: PMC5056612.
2. Rozier L, Guo Y, Peterson S, Sato M, Baer R, Gautier J, Mao Y. The MRN-CtIP pathway is required for metaphase chromosome alignment. Mol Cell. 2013 Mar 28;49(6):1097-107. doi: 10.1016/j.molcel.2013.01.023. Epub 2013 Feb 21. PMID: 23434370; PMCID: PMC3615147.

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7. Bioactivity

Biological target:

Mirin is a small-molecule inhibitor of MRN (Mre11, Rad50, and Nbs1) complex.

In vitro activity

Consistently, mirin induced accumulation of 53BP1 nuclear bodies, a known marker of replication-associated DNA damage, and DNA DSBs, in MNA but not MNSC cells (Fig. 3a, b). Furthermore, it induced H2AX and p53 phosphorylation in all MNA but not in MNSC cells (Fig. 3c), indicating the activation of a DDR. Early accumulation of DNA damage and DDR ended up in apoptotic cell death in MNA but not MNSC cells, as indicated by the trypan blue exclusion assay, expression of the cleaved forms of PARP1 and Caspase-3 and TUNEL staining (Fig. 3c, d).

Reference: Cell Death Dis. 2018 Sep; 9(9): 895. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6117286/

In vivo activity

As an alternative approach the study used the small molecule inhibitor mirin, which inhibits nuclease activity of MRE11 and prevents MRN-dependent signal amplification in somatic cells. Treatment of prophase I arrested GV-stage mouse oocytes with 100 μM mirin for 1 h did not affect the number of γH2AX/MDC1 foci (Fig. 4C-D), whereas when DNA damage was induced by NCS (neocarzinostatin) in the presence of mirin the number of γH2AX/MDC1 foci was significantly reduced compared to NCS only (Fig. 4C-E). Inhibition of MRE11 during meiotic maturation by mirin substantially decreased the amount of chromatin-associated phosphorylated H2AX and MDC1 binding in MI oocytes (Fig. 4C-F), followed by the increase in γH2AX foci number on metaphase II chromosomes (Fig. 4C-D). The number of MII eggs with at least one γH2AX focus was highly increased after mirin treatment during meiotic maturation (Fig. 4G).

Reference: Cell Cycle. 2016; 15(4): 546–558. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5056612/

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.