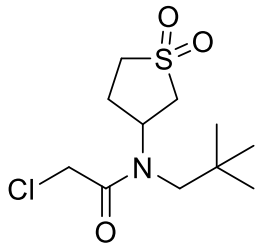
Product data sheet

MedKoo Cat#: 465541 Name: Sulfopin CAS#: 2451481-08-4 Chemical Formula: $C_{11}H_{20}ClNO_3S$ Exact Mass: 281.0852 Molecular Weight: 281.795	
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:
Sulfopin is a covalent inhibitor of Pin1 that blocks Myc-driven tumors in vivo. Sulfopin is highly selective, as validated by two independent chemoproteomics methods, achieves potent cellular and in vivo target engagement and phenocopies Pin1 genetic knockout. Sulfopin induced downregulation of c-Myc target genes, reduced tumor progression and conferred survival benefit in murine and zebrafish models of MYCN-driven neuroblastoma, and in a murine model of pancreatic cancer. Sulfopin is a chemical probe suitable for assessment of Pin1-dependent pharmacology in cells and in vivo, and that Pin1 warrants further investigation as a potential cancer drug target.

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	78.0	276.80

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	3.55 mL	17.74 mL	35.49 mL
5 mM	0.71 mL	3.55 mL	7.10 mL
10 mM	0.35 mL	1.77 mL	3.55 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. Dubiella C, Pinch BJ, Koikawa K, Zaidman D, Poon E, Manz TD, Nabet B, He S, Resnick E, Rogel A, Langer EM, Daniel CJ, Seo HS, Chen Y, Adelmant G, Sharifzadeh S, Ficarro SB, Jamin Y, Martins da Costa B, Zimmerman MW, Lian X, Kibe S, Kozono S, Doctor ZM, Browne CM, Yang A, Stoler-Barak L, Shah RB, Vangos NE, Geffken EA, Oren R, Koide E, Sidi S, Shulman Z, Wang C, Marto JA, Dhe-Paganon S, Look T, Zhou XZ, Lu KP, Sears RC, Chesler L, Gray NS, London N. Sulfopin is a covalent inhibitor of Pin1 that blocks Myc-driven tumors in vivo. Nat Chem Biol. 2021 Sep;17(9):954-963. doi: 10.1038/s41589-021-00786-7. Epub 2021 May 10. PMID: 33972797.

In vivo study

1. Dubiella C, Pinch BJ, Koikawa K, Zaidman D, Poon E, Manz TD, Nabet B, He S, Resnick E, Rogel A, Langer EM, Daniel CJ, Seo HS, Chen Y, Adelmant G, Sharifzadeh S, Ficarro SB, Jamin Y, Martins da Costa B, Zimmerman MW, Lian X, Kibe S, Kozono S, Doctor ZM, Browne CM, Yang A, Stoler-Barak L, Shah RB, Vangos NE, Geffken EA, Oren R, Koide E, Sidi S, Shulman Z, Wang C, Marto JA, Dhe-Paganon S, Look T, Zhou XZ, Lu KP, Sears RC, Chesler L, Gray NS, London N. Sulfopin is a covalent inhibitor of

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Pin1 that blocks Myc-driven tumors in vivo. Nat Chem Biol. 2021 Sep;17(9):954-963. doi: 10.1038/s41589-021-00786-7. Epub 2021 May 10. PMID: 33972797.

7. Bioactivity

Biological target:

Sulfopin (PIN1-3) is a highly selective covalent inhibitor of Pin1 with an apparent Ki of 17 nM.

In vitro activity

To test whether Sulfopin affects Myc transcriptional output, Mino B cells were treated with either Sulfopin (1 μM, 6 h, in triplicate) or DMSO and performed a global RNA-seq analysis to detect differentially expressed genes: 206 genes were found to be significantly downregulated. Enrichr analysis of these transcripts, to identify transcription factors coordinating this response41, identified Myc target genes as the first and third most enriched sets in K562 and HeLa-S3 cells (adjusted $P = 1.99 \times 10{-}16$ and $2.00 \times 10{-}13$, respectively), suggesting that Sulfopin downregulates Myc's transcriptional signature. This finding matches the reported transcriptional effects of BJP-06-005-3 in PATU-8988T cells27. To further validate the effect of Sulfopin on Myc transcriptional activity, HEK293 cells were cotransfected with a Myc reporter construct (4× E-box luciferase) and Pin1. As expected, Pin1 expression increased Myc transcriptional activity while treatment with 2 μM Sulfopin for 48 h resulted in a significant reduction in relative luciferase activity. These results suggest that treatment with Sulfopin downregulates Myc target genes, making Myc-driven cancers natural candidates for its therapeutic application.

Reference: Nat Chem Biol. 2021 Sep;17(9):954-963. https://pubmed.ncbi.nlm.nih.gov/33972797/

In vivo activity

The effects of Sulfopin were assessed in a murine model of neuroblastoma, Th-MYCN genetically engineered mice, in which human MYCN is expressed under the tyrosine hydroxylase promoter. Once tumors had become palpable, mice were randomly assigned to treatment groups and treated once (QD) or twice (BID) per day with either vehicle or 40 mg kg–1 Sulfopin. Tumor sizes were monitored over 7 days of treatment via magnetic resonance imaging (MRI). With the exception of one mouse, all tumors treated BID showed significant reduction in size, two of which showed near complete response. Sulfopin-treated QD mice showed a significant ($P = 0.0127$) average increase in survival of 10 days, while Sulfopin-treated BID mice showed an even more pronounced ($P = 0.0049$) average increase of 28 days. It is noted that mice in the BID arm received only 56 doses of compound (dose license limit).

Reference: Nat Chem Biol. 2021 Sep;17(9):954-963. https://pubmed.ncbi.nlm.nih.gov/33972797/