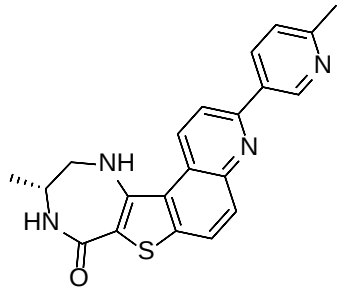
Product data sheet

MedKoo Cat#: 532465 Name: PF-3644022 CAS: 1276121-88-0 Chemical Formula: $C_{21}H_{18}N_4OS$ Exact Mass: 374.1201 Molecular Weight: 374.462	
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:

PF-3644022 is a potent, ATP-competitive inhibitor of mitogen-activated protein kinase (MAPK)-activated protein kinase-2 (MK2) (IC50 = 5.2 nM; Ki = 3 nM). PF-3644022 inhibits tumor necrosis factor α (TNFα) production in U937 monocytic cells and peripheral blood mononuclear cells (PBMCs) (IC50 = 160 nM).

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	43.88	117.19

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.67 mL	13.35 mL	26.71 mL
5 mM	0.53 mL	2.67 mL	5.34 mL
10 mM	0.27 mL	1.34 mL	2.67 mL
50 mM	0.05 mL	0.27 mL	0.53 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. Mourey RJ, Burnette BL, Brustkern SJ, Daniels JS, Hirsch JL, Hood WF, Meyers MJ, Mnich SJ, Pierce BS, Saabye MJ, Schindler JF, South SA, Webb EG, Zhang J, Anderson DR. A benzothiophene inhibitor of mitogen-activated protein kinase-activated protein kinase 2 inhibits tumor necrosis factor alpha production and has oral anti-inflammatory efficacy in acute and chronic models of inflammation. J Pharmacol Exp Ther. 2010 Jun;333(3):797-807. doi: 10.1124/jpet.110.166173. Epub 2010 Mar 17. PMID: 20237073.

In vivo study

1. Yu L, Song H, Fang X, Hu Y. Role of MK2 signaling pathway mediating microglia/macrophages polarization in chronic compression injury of cervical spinal cord. Ann Palliat Med. 2021 Feb;10(2):1304-1312. doi: 10.21037/apm-20-396. Epub 2020 Sep 24. PMID: 33040559.
2. Song H, Fang X, Wen M, Yu F, Gao K, Sun C, Wang Z. Role of MK2 signaling pathway in the chronic compression of cervical spinal cord. Am J Transl Res. 2015 Nov 15;7(11):2355-63. PMID: 26807183; PMCID: PMC4697715.

7. Bioactivity

Biological target:

PF-3644022 is a potent, selective, orally active and ATP-competitive MAPKAPK2 (MK2) inhibitor with an IC50 of 5.2 nM and a Ki of 3 nM.

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In vitro activity

PF-3644022 is a potent freely reversible ATP-competitive compound that inhibits MK2 activity (K(i) = 3 nM) with good selectivity when profiled against 200 human kinases. In the human U937 monocytic cell line or peripheral blood mononuclear cells, PF-3644022 potently inhibits TNFalpha production with similar activity (IC(50) = 160 nM). PF-3644022 blocks TNFalpha and IL-6 production in LPS-stimulated human whole blood with IC(50) values of 1.6 and 10.3 microM, respectively. Inhibition of TNFalpha in U937 cells and blood correlates closely with inhibition of phospho-heat shock protein 27, a target biomarker of MK2 activity.

Reference: J Pharmacol Exp Ther. 2010 Jun;333(3):797-807. https://pubmed.ncbi.nlm.nih.gov/20237073/

In vivo activity

Western blot and Real-time PCR showed that the expressions of iNOS and Arg-1 in the compressed spinal cord of twy/twy mice were significantly higher than those of the control group. After treatment with PF-3644022, the expression of Arg1 was increased while that of iNOS decreased. Realtime PCR revealed the increased expressions of inflammation related factors (such as IL-1β, NF-κB, TNF-α, MK2) and pro-apoptotic gene (Bax) except the decreased expression of anti-apoptotic gene (Bcl-2). Nevertheless, such increases were vanished after treatment of PF-3644022 except an increased expression of Bcl-2. The BMS score showed a reduced motor function of the twy/twy mice. The motor function was enhanced again with the treatment of PF-3644022.

Reference: Ann Palliat Med. 2021 Feb;10(2):1304-1312. https://pubmed.ncbi.nlm.nih.gov/33040559/

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.