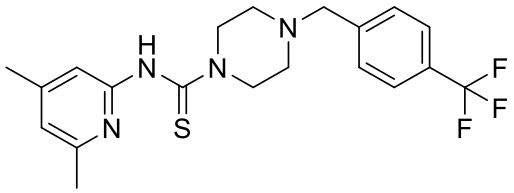
Product data sheet

MedKoo Cat#: 407371 Name: NCT-503 CAS#: 1916571-90-8 Chemical Formula: $C_{20}H_{23}F_3N_4S$ Exact Mass: 408.1596 Molecular Weight: 408.4872	
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:
NCT-503 is an inhibitor of 3-phosphoglycerate dehydrogenase (PHGDH), inhibiting serine synthesis from 3-phosphoglycerate in cells with an IC50 value of 2.5 μM.

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	50.0	122.41

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.45 mL	12.24 mL	24.48 mL
5 mM	0.49 mL	2.45 mL	4.90 mL
10 mM	0.24 mL	1.22 mL	2.45 mL
50 mM	0.05 mL	0.24 mL	0.49 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. Pacold ME, Brimacombe KR, Chan SH, Rohde JM, Lewis CA, Swier LJ, Possemato R, Chen WW, Sullivan LB, Fiske BP, Cho S, Freinkman E, Birsoy K, Abu-Remaileh M, Shaul YD, Liu CM, Zhou M, Koh MJ, Chung H, Davidson SM, Luengo A, Wang AQ, Xu X, Yasgar A, Liu L, Rai G, Westover KD, Vander Heiden MG, Shen M, Gray NS, Boxer MB, Sabatini DM. A PHGDH inhibitor reveals coordination of serine synthesis and one-carbon unit fate. Nat Chem Biol. 2016 Jun;12(6):452-8. doi: 10.1038/nchembio.2070. Epub 2016 Apr 25. Erratum in: Nat Chem Biol. 2016 Jul 19;12 (8):656. PMID: 27110680; PMCID: PMC4871733.

2. Rohde JM, Brimacombe KR, Liu L, Pacold ME, Yasgar A, Cheff DM, Lee TD, Rai G, Baljinnyam B, Li Z, Simeonov A, Hall MD, Shen M, Sabatini DM, Boxer MB. Discovery and optimization of piperazine-1-thiourea-based human phosphoglycerate dehydrogenase inhibitors. Bioorg Med Chem. 2018 May 1;26(8):1727-1739. doi: 10.1016/j.bmc.2018.02.016. Epub 2018 Feb 27. PMID: 29555419; PMCID: PMC5891386.

In vivo study

1. Pacold ME, Brimacombe KR, Chan SH, Rohde JM, Lewis CA, Swier LJ, Possemato R, Chen WW, Sullivan LB, Fiske BP, Cho S, Freinkman E, Birsoy K, Abu-Remaileh M, Shaul YD, Liu CM, Zhou M, Koh MJ, Chung H, Davidson SM, Luengo A, Wang AQ, Xu X, Yasgar A, Liu L, Rai G, Westover KD, Vander Heiden MG, Shen M, Gray NS, Boxer MB, Sabatini DM. A PHGDH inhibitor reveals coordination of serine synthesis and one-carbon unit fate. Nat Chem Biol. 2016 Jun;12(6):452-8. doi: 10.1038/nchembio.2070. Epub 2016 Apr 25. Erratum in: Nat Chem Biol. 2016 Jul 19;12 (8):656. PMID: 27110680; PMCID: PMC4871733.

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2. Hamanaka RB, Nigdelioglu R, Meliton AY, Tian Y, Witt LJ, O'Leary E, Sun KA, Woods PS, Wu D, Ansbro B, Ard S, Rohde JM, Dulin NO, Guzy RD, Mutlu GM. Inhibition of Phosphoglycerate Dehydrogenase Attenuates Bleomycin-induced Pulmonary Fibrosis. Am J Respir Cell Mol Biol. 2018 May;58(5):585-593. doi: 10.1165/rcmb.2017-0186OC. PMID: 29019702; PMCID: PMC5946329.

7. Bioactivity

Biological target:

NCT-503 is a phosphoglycerate dehydrogenase (PHGDH) inhibitor with an IC50 of 2.5 μM.

In vitro activity

Human phosphoglycerate dehydrogenase (PHGDH) catalyzes the first, rate-limiting step in the canonical glucose-derived serine synthesis pathway. NCT-503, a PHGDH inhibitor, inhibits serine synthesis from 3-phosphoglycerate in cells (IC50=2.5 μM). NCT-503 is inactive against a panel of other dehydrogenases and shows minimal cross-reactivity in a panel of 168 GPCRs. Competition studies of NCT-503 against 3-phosphoglycerate (3-PG) and the co-substrate NAD+ reveal a non-competitive mode of inhibition with respect to both 3-PG and NAD+. NCT-503 has EC50s of 8–16 μM for the PHGDH-dependent cell lines, a 6- to 10-fold higher EC50 for MDA-MB-231 cells, and no toxicity towards other PHGDH-independent cell lines.

Reference: Nat Chem Biol. 2016 Jun;12(6):452-8. https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/27110680/

In vivo activity

NCT-503 exhibits favorable absorption, distribution, metabolism and excretion (ADME) properties. NCT-503 has good exposure, half-life (2.5 hr) and Cmax (20 μM in plasma) following intraperitoneal administration with significant partitioning into the liver and brain. NCT-503 treatment reduces the growth and weight of PHGDH-dependent MDA-MB-468 xenografts but does not affect the growth or weight of PHGDH-independent MDA-MB-231 xenografts.

Reference: Nat Chem Biol. 2016 Jun;12(6):452-8. https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/27110680/

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.