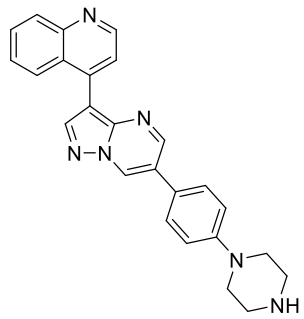
Product data sheet

MedKoo Cat#: 501105 Name: LDN-193189 CAS#: 1062368-24-4 (free base) Chemical Formula: $C_{25}H_{22}N_6$ Exact Mass: 406.19059 Molecular Weight: 406.48238 Elemental Analysis: C, 73.87; H, 5.46; N, 20.67	
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:
LDN193189 is a highly potent small molecule BMP inhibitor with IC50 of 5 and 30 nM for ALK2 and ALK3, respectively. LDN193189 also inhibits BMP type I receptors ALK6 (TGFβ1/BMP signaling) and subsequent SMAD phosphorylation.

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	12	29.52
Ethanol	1	2.46

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.46 mL	12.30 mL	24.60 mL
5 mM	0.49 mL	2.46 mL	4.92 mL
10 mM	0.25 mL	1.23 mL	2.46 mL
50 mM	0.05 mL	0.25 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. Yu PB, Deng DY, Lai CS, Hong CC, Cuny GD, Bouxsein ML, Hong DW, McManus PM, Katagiri T, Sachidanandan C, Kamiya N, Fukuda T, Mishina Y, Peterson RT, Bloch KD. BMP type I receptor inhibition reduces heterotopic [corrected] ossification. Nat Med. 2008 Dec;14(12):1363-9. doi: 10.1038/nm.1888. Epub 2008 Nov 30. Erratum in: Nat Med. 2009 Jan;15(1):117. PMID: 19029982; PMCID: PMC2846458.

In vivo study

1. Lee YC, Cheng CJ, Bilen MA, Lu JF, Satcher RL, Yu-Lee LY, Gallick GE, Maity SN, Lin SH. BMP4 promotes prostate tumor growth in bone through osteogenesis. Cancer Res. 2011 Aug 1;71(15):5194-203. doi: 10.1158/0008-5472.CAN-10-4374. Epub 2011 Jun 13. PMID: 21670081; PMCID: PMC3148283.

2. Vollaire J, Machuca-Gayet I, Lavaud J, Bellanger A, Bouazza L, El Moghrabi S, Treilleux I, Coll JL, Peyruchaud O, Josserand V, Cohen PA. The Bone Morphogenetic Protein Signaling Inhibitor LDN-193189 Enhances Metastasis Development in Mice. Front Pharmacol. 2019 Jun 19;10:667. doi: 10.3389/fphar.2019.00667. PMID: 31275146; PMCID: PMC6593094.

7. Bioactivity

Product data sheet

Biological target:

LDN-193189 (DM3189) is a selective BMP signaling inhibitor, inhibits the transcriptional activity of the BMP type I receptors ALK2 and ALK3 with IC50 of 5 nM and 30 nM in C2C12 cells, respectively, exhibits 200-fold selectivity for BMP versus TGF-β.

In vitro activity

LDN193189 inhibits BMP4-mediated Smad1, Smad5 and Smad8 activation with greater potency than did dorsomorphin (IC50=5 nM versus 470 nM) while retaining 200-fold selectivity for BMP signaling versus TGF-β signaling (IC50 for TGF-β ⩾1,000 nM). LDN193189 efficiently inhibits transcriptional activity of the BMP type I receptors ALK2 and ALK3 (IC50=5 nM and 30 nM, respectively), and the TGF-β type I receptors ALK4, ALK5 and ALK7 (IC50⩾500 nM) and increases selectivity for BMP signaling versus AMP-activated protein kinase, PDGFR and MAPK signaling pathways as compared to the parent compound. LDN-193189 blocks the transcriptional activity induced by either constitutively active ALK2R206H or ALK2Q207D mutant proteins. These findings suggest that LDN193189 might affect BMP-induced osteoblast differentiation. In fact, LDN193189 inhibits the induction of alkaline phosphatase activity in C2C12 cells by BMP4 even when administered 12 h after BMP stimulation, indicating sustained BMP signaling activity is needed for osteogenic differentiation.

Reference: Nat Med. 2008 Dec;14(12):1363-9. https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/19029982/

In vivo activity

In the present study, the aim was to investigate the impact of the LDN-193189 compound, a potent inhibitor of the BMP type I receptor, on metastasis development in vivo. ZNF217-revLuc cells were injected into the left ventricle of nude mice (n = 16) while control mice (n = 13) were inoculated with control pcDNA6-revLuc cells. Mice from each group were treated or not with LDN-193189 for 35 days. We found that systemic LDN-193189 treatment of mice significantly enhanced metastasis development, by increasing both the number and the size of metastases. In pcDNA6-revLuc-injected mice, LDN-193189 also affected the kinetics of metastasis emergence. Altogether, these data suggest that in vivo, LDN-193189 might affect the interaction between breast cancer cells and the bone environment, favoring the emergence and development of multiple metastases. Hence, our report highlights the importance of the choice of drugs and therapeutic strategies used in the management of bone metastases.

Reference: Front Pharmacol. 2019 Jun 19;10:667. https://www.ncbi.nlm.nih.gov/pmc/articles/pmid/31275146/

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.