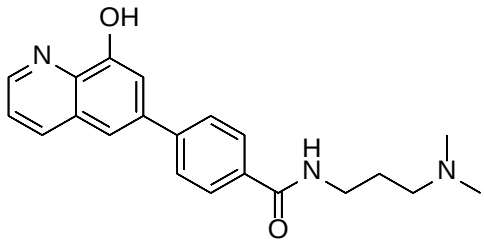
Product data sheet

MedKoo Cat#: 526895 Name: ML-324 CAS: 1222800-79-4 Chemical Formula: $C_{21}H_{23}N_3O_2$ Exact Mass: 349.179 Molecular Weight: 349.434	
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:
ML-324, also known as CID-44143209, is a potent JMJD2 demethylase inhibitor with demonstrated antiviral activity.ML-324 displays submicromolar inhibitory activity toward JMJD2E (in vitro) and possesses excellent in vitro ADME properties. ML324 displays excellent cell permeability providing an opportunity for more extensive cell-based studies of JMJD2 enzymes to be undertaken. In addition, ML324 demonstrates potent anti-viral activity against both herpes simplex virus (HSV) and human cytomegalovirus (hCMV) infection via inhibition viral IE gene expression.

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
DMF	20.0	57.24
DMSO	25.63	73.33
DMSO:PBS (pH 7.2) (1:1)	0.5	1.43
Ethanol	5.0	14.31

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.86 mL	14.31 mL	28.62 mL
5 mM	0.57 mL	2.86 mL	5.72 mL
10 mM	0.29 mL	1.43 mL	2.86 mL
50 mM	0.06 mL	0.29 mL	0.57 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. Kim SY, Hwang S, Lee BR, Hong JA, Sung YH, Kim I. Inhibition of histone demethylase KDM4 by ML324 induces apoptosis through the unfolded protein response and Bim upregulation in hepatocellular carcinoma cells. Chem Biol Interact. 2022 Feb 1;353:109806. doi: 10.1016/j.cbi.2022.109806. Epub 2022 Jan 7. PMID: 34999051.
2. Reader J, van der Watt ME, Taylor D, Le Manach C, Mittal N, Ottilie S, Theron A, Moyo P, Erlank E, Nardini L, Venter N, Lauterbach S, Bezuidenhout B, Horatscheck A, van Heerden A, Spillman NJ, Cowell AN, Connacher J, Opperman D, Orchard LM, Llinás M, Istvan ES, Goldberg DE, Boyle GA, Calvo D, Mancama D, Coetzer TL, Winzeler EA, Duffy J, Koekemoer LL, Basarab G, Chibale K, Birkholtz LM. Multistage and transmission-blocking targeted antimalarials discovered from the open-source MMV Pandemic Response Box. Nat Commun. 2021 Jan 11;12(1):269. doi: 10.1038/s41467-020-20629-8. PMID: 33431834; PMCID: PMC7801607.

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In vivo study

1. Matsuoka S, Petri G, Larson K, Behnke A, Wang X, Peng M, Spagnoli S, Lohr C, Milston-Clements R, Divilov K, Jin L. Evaluation of Histone Demethylase Inhibitor ML324 and Acyclovir against Cyprinid herpesvirus 3 Infection. Viruses. 2023 Jan 5;15(1):163. doi: 10.3390/v15010163. PMID: 36680202; PMCID: PMC9863241.
2. Rai G, Kawamura A, Tumber A, Liang Y, Vogel JL, Arbuckle JH, Rose NR, Dexheimer TS, Foley TL, King ON, Quinn A, Mott BT, Schofield CJ, Oppermann U, Jadhav A, Simeonov A, Kristie TM, Maloney DJ. Discovery of ML324, a JMJD2 demethylase inhibitor with demonstrated antiviral activity. 2012 Dec 17 [updated 2013 Sep 16]. In: Probe Reports from the NIH Molecular Libraries Program [Internet]. Bethesda (MD): National Center for Biotechnology Information (US); 2010–. PMID: 24260783.

7. Bioactivity

Biological target:

ML324 is a JMJD2 demethylase inhibitor with antiviral activity. ML324 also exhibits inhibition for the histone demethylase KDM4B, with an IC_{50} of 4.9 μM.

In vitro activity

Incubation of HCC cells with ML324 upregulated death receptor 5 (DR5) expression through the activation transcription factor 3 (ATF3)-C/EBP homologous protein (CHOP)-dependent pathway. This study showed that the loss of Bim suppressed ML324-induced apoptosis by flow cytometry analysis, colony formation assay, and caspase-3 activation assay. Interestingly, BIM protein expression by ML324 was regulated by ATF3, CHOP, and DR5 which are factors involved in UPR.

Reference: Chem Biol Interact. 2022 Feb 1;353:109806. https://pubmed.ncbi.nlm.nih.gov/34999051/

In vivo activity

A significant reduction of CyHV-3 replication was observed in ~6-month-old infected koi treated with 20 μM ML324 in an immersion bath for 3-4 h at 1-, 3-, and 5-days post-infection compared to the control and ACV treatments. Under heat stress, 50-70% of 3-4-month-old koi survived CyHV-3 infection when they were treated daily with 20 μM ML324 in an immersion bath for 3-4 h within the first 5 d post-infection (dpi), compared to 11-19% and 22-27% of koi in the control and ACV treatments, respectively.

Reference: Viruses. 2023 Jan 5;15(1):163. https://pubmed.ncbi.nlm.nih.gov/36680202/

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.