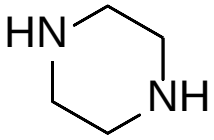
Product data sheet

MedKoo Cat#: 318498 Name: Piperazine CAS: 110-85-0 (free base) Chemical Formula: $C_4H_{10}N_2$ Exact Mass: 86.0844 Molecular Weight: 86.138	
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:
Piperazine is an organic compound that consists of a six-membered ring containing two nitrogen atoms at opposite positions in the ring. Piperazine exists as small alkaline deliquescent crystals with a saline taste. Piperazine was introduced to medicine as a solvent for uric acid.

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	30.0	348.28
DMF:PBS (pH 7.2) (1:2)	0.33	3.83
DMSO	30.0	348.28
Ethanol	23.5	272.82
Water	17.0	197.36

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	11.61 mL	58.05 mL	116.09 mL
5 mM	2.32 mL	11.61 mL	23.22 mL
10 mM	1.16 mL	5.81 mL	1.16 mL
50 mM	0.23 mL	1.16 mL	2.32 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. Del Rosario García-Lozano M, Dragoni F, Gallego P, Mazzotta S, López-Gómez A, Boccuto A, Martínez-Cortés C, Rodríguez-Martínez A, Pérez-Sánchez H, Manuel Vega-Pérez J, Antonio Del Campo J, Vicenti I, Vega-Holm M, Iglesias-Guerra F. Piperazine-derived small molecules as potential Flaviviridae NS3 protease inhibitors. In vitro antiviral activity evaluation against Zika and Dengue viruses. Bioorg Chem. 2023 Apr;133:106408. doi: 10.1016/j.bioorg.2023.106408. Epub 2023 Feb 4. PMID: 36801791.
2. Liang T, Xie Z, Dang B, Wang J, Zhang T, Luan X, Lu T, Cao C, Chen X. Discovery of indole-piperazine derivatives as selective histone deacetylase 6 inhibitors with neurite outgrowth-promoting activities and neuroprotective activities. Bioorg Med Chem Lett. 2023 Feb 1;81:129148. doi: 10.1016/j.bmcl.2023.129148. Epub 2023 Jan 21. PMID: 36690041.

In vivo study

Product data sheet

1. Li Z, Meng X, Ma G, Liu W, Li W, Cai Q, Wang S, Huang G, Zhang Y. Increasing brain glucose metabolism by ligustrazine piperazine ameliorates cognitive deficits through PPARγ-dependent enhancement of mitophagy in APP/PS1 mice. Alzheimers Res Ther. 2022 Oct 11;14(1):150. doi: 10.1186/s13195-022-01092-7. PMID: 36217155; PMCID: PMC9552451.
2. Ni H, Hatit MZC, Zhao K, Loughrey D, Lokugamage MP, Peck HE, Cid AD, Muralidharan A, Kim Y, Santangelo PJ, Dahlman JE. Piperazine-derived lipid nanoparticles deliver mRNA to immune cells in vivo. Nat Commun. 2022 Aug 15;13(1):4766. doi: 10.1038/s41467-022-32281-5. PMID: 35970837; PMCID: PMC9376583.

7. Bioactivity

Biological target:

Piperazine is an organic compound that consists of a six-membered ring containing two nitrogen atoms at opposite positions in the ring.

In vitro activity

This work presents a library of 34 piperazine-derived small molecules as potential Flaviviridae NS3 protease inhibitors. The library was developed through a privileged structures-based design and then biologically screened using a live virus phenotypic assay to determine the half-maximal inhibitor concentration (IC50) of each compound against ZIKV and DENV. Two lead compounds, 42 and 44, with promising broad-spectrum activity against ZIKV (IC50 6.6 μM and 1.9 μM respectively) and DENV (IC50 6.7 μM and 1.4 μM respectively) and a good security profile were identified.

Reference: Bioorg Chem. 2023 Apr;133:106408. https://pubmed.ncbi.nlm.nih.gov/36801791/

In vivo activity

LPD (ligustrazine piperazine derivative) treatment dose-dependently reduced Aβ40 and Aβ42 levels in PC12 cells stably transfected with APP695swe and PSEN1dE9. Intragastric administration of LPD for 3 months dose-dependently reversed cognitive deficits in APP/PS1 mice. LPD treatment substantially decreased hippocampal Aβ plaques in APP/PS1 mice and decreased the levels of Aβ40 and Aβ42 in vivo and in vitro. Moreover, LPD treatment induced mitophagy in vivo and in vitro and increased brain 18F-FDG uptake in APP/PS1 mice.

Reference: Alzheimers Res Ther. 2022 Oct 11;14(1):150. https://pubmed.ncbi.nlm.nih.gov/36217155/

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.