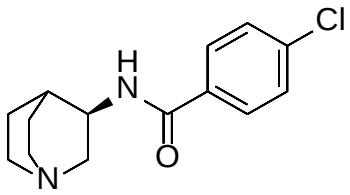
Product data sheet

MedKoo Cat#: 526029 Name: PNU-282987 free base CAS: 711085-63-1 (free base) Chemical Formula: $C_{14}H_{17}ClN_2O$ Exact Mass: 264.1029 Molecular Weight: 264.753	
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:

PNU-282987 is a highly selective α7 nAChR agonist (Ki = 26 nM) displaying negligible blockade of α1β1 γ δ and α3β4 nAChRs (IC50≥60 μM). PNU-282987 is inactive against a panel of 32 receptors at 1 μM, except 5-HT3 receptors (Ki = 930 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
DMF	10.0	37.77
DMSO	36.49	137.84
Ethanol	36.5	137.86
PBS (pH 7.2)	5.0	18.89

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.78 mL	18.89 mL	37.77 mL
5 mM	0.76 mL	3.78 mL	7.55 mL
10 mM	0.38 mL	1.89 mL	3.78 mL
50 mM	0.08 mL	0.38 mL	0.76 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. Zhang Y, Ma R, Wang W, Deng Q, Cao C, Yu C, Li S, Shi L, Tian J. Activation of α7nAChR by PNU282987 improves cognitive impairment through inhibiting oxidative stress and neuroinflammation in D-galactose induced aging via regulating α7nAChR/Nrf2/HO-1 signaling pathway. Exp Gerontol. 2023 May;175:112139. doi: 10.1016/j.exger.2023.112139. Epub 2023 Mar 10. PMID: 36898594.
2. Hua Y, Yang B, Chen Q, Zhang J, Hu J, Fan Y. Activation of α7 Nicotinic Acetylcholine Receptor Protects Against 1-Methyl-4-Phenylpyridinium-Induced Astroglial Apoptosis. Front Cell Neurosci. 2019 Nov 12;13:507. doi: 10.3389/fncel.2019.00507. PMID: 31780901; PMCID: PMC6861188.

In vivo study

1. Spitsbergen JB, Webster SE, Linn CL. Functional Changes in the Adult Mouse Retina using an Alpha7 Nicotinic Acetylcholine Receptor Agonist after Blast Exposure. Neuroscience. 2023 Feb 21;512:1-15. doi: 10.1016/j.neuroscience.2022.12.017. Epub 2022 Dec 24. PMID: 36572172.
2. Hajós M, Hurst RS, Hoffmann WE, Krause M, Wall TM, Higdon NR, Groppi VE. The selective alpha7 nicotinic acetylcholine receptor agonist PNU-282987 [N-[(3R)-1-Azabicyclo[2.2.2]oct-3-yl]-4-chlorobenzamide hydrochloride] enhances GABAergic

synaptic activity in brain slices and restores auditory gating deficits in anesthetized rats. J Pharmacol Exp Ther. 2005 Mar;312(3):1213-22. doi: 10.1124/jpet.104.076968. Epub 2004 Nov 2. PMID: 15523001.

7. Bioactivity

Biological target:

PNU-282987 is a highly selective α7 nAChR agonist (Ki = 26 nM).

In vitro activity

In the present study, using pharmacological inhibition and genetic knockout of α7nAChR, this study assessed the antiapoptotic effects of an α7nAChR agonist PNU-282987 in primary cultured astrocytes treated with 1-methyl-4-phenylpyridinium (MPP^+). PNU-282987 promoted the viability of astrocytes, alleviated MPP^+ induced apoptosis, and decreased the number of $GFAP^+/TUNEL^+$ cells. Meanwhile, PNU-282987 upregulated the expression of the antiapoptotic protein Bcl-2 and downregulated the expression of the apoptotic protein Bax and cleaved-caspase-3. Moreover, the suppression of the JNK-p53-caspase-3 signaling may underlie the neuroprotective property of PNU-282987. Therefore, PNU-282987 ameliorates astroglial apoptosis induced by MPP^+ through α7nAChR-JNK-p53 signaling.

Reference: Front Cell Neurosci. 2019 Nov 12;13:507. https://pubmed.ncbi.nlm.nih.gov/31780901/

In vivo activity

Amphetamine-induced sensory gating deficit, determined by auditory-evoked potentials in hippocampal CA3 region, was restored by systemic administration of PNU-282987 in chloral hydrate-anesthetized rats. Auditory gating of rat reticular thalamic neurons was also disrupted by amphetamine; however, PNU-282987 normalized gating deficit only in a subset of tested neurons (6 of 11). Furthermore, PNU-282987 improved the inherent hippocampal gating deficit occurring in a subpopulation of anesthetized rats, and enhanced amphetamine-induced hippocampal oscillation. This study proposes that the alpha7 nAChR agonist PNU-282987, via modulating/enhancing hippocampal GABAergic neurotransmission, improves auditory gating and enhances hippocampal oscillatory activity.

Reference: J Pharmacol Exp Ther. 2005 Mar;312(3):1213-22. https://pubmed.ncbi.nlm.nih.gov/15523001/