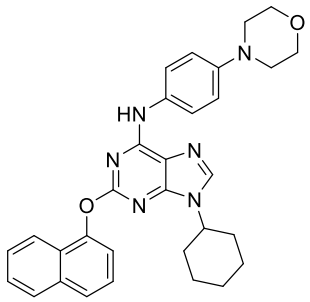
Product data sheet

MedKoo Cat#: 406133 Name: Purmorphamine CAS#: 483367-10-8 Chemical Formula: $C_{31}H_{32}N_6O_2$ Exact Mass: 520.25867 Molecular Weight: 520.62	
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:

Purmorphamine is a Hedgehog agonist, which activates the Hedgehog pathway by targeting Smoothened. Purmorphamine induces osteogenesis by activation of the hedgehog signaling pathway. Purmorphamine increases DARPP-32 differentiation in human striatal neural stem cells through the Hedgehog pathway. Purmorphamine enhances osteogenic activity of human osteoblasts derived from bone marrow mesenchymal cells. Hedgehog (Hh) signaling is an important regulator of embryonic patterning, tissue regeneration, stem cell renewal and cancer growth.

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	10.0	19.2

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.92 mL	9.60 mL	19.21 mL
5 mM	0.38 mL	1.92 mL	3.84 mL
10 mM	0.19 mL	0.96 mL	1.92 mL
50 mM	0.04 mL	0.19 mL	0.38 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. Gu D, Wang S, Zhang S, Zhang P, Zhou G. Directed transdifferentiation of Müller glial cells to photoreceptors using the sonic hedgehog signaling pathway agonist purmorphamine. Mol Med Rep. 2017 Dec;16(6):7993-8002. doi: 10.3892/mmr.2017.7652. Epub 2017 Sep 28. PMID: 28983586; PMCID: PMC5779882.
2. Bahrami N, Malekolkottab F, Ebrahimi-Barough S, Alizadeh Tabari Z, Hamisi J, Kamyab A, Mohamadnia A, Ai A, Bayat F, Bahrami N, Ai J. The effect of purmorphamine on differentiation of endometrial stem cells into osteoblast-like cells on collagen/hydroxyapatite scaffolds. Artif Cells Nanomed Biotechnol. 2017 Nov;45(7):1343-1349. doi: 10.1080/21691401.2016.1236804. Epub 2016 Sep 30. PMID: 27686538.

In vivo study

1. Rahi S, Gupta R, Sharma A, Mehan S. Smo-Shh signaling activator purmorphamine ameliorates neurobehavioral, molecular, and morphological alterations in an intracerebroventricular propionic acid-induced experimental model of autism. Hum Exp Toxicol. 2021 Apr 28:9603271211013456. doi: 10.1177/09603271211013456. Epub ahead of print. PMID: 33906504.

2. Liu D, Bai X, Ma W, Xin D, Chu X, Yuan H, Qiu J, Ke H, Yin S, Chen W, Wang Z. Purmorphamine Attenuates Neuro-Inflammation and Synaptic Impairments After Hypoxic-Ischemic Injury in Neonatal Mice via Shh Signaling. Front Pharmacol. 2020 Mar 4;11:204. doi: 10.3389/fphar.2020.00204. PMID: 32194421; PMCID: PMC7064623.

7. Bioactivity

Biological target:

Purmorphamine (Shh Signaling Antagonist VI) is a smoothened/Smo receptor agonist with an EC50 of 1 μM.

In vitro activity

Purmorphamine stimulates Müller glial cell proliferation by upregulating cyclin D1 and cyclin D3 expression. Purmorphamine induces dedifferentiation of these cells, leading to the expression of progenitor-specific markers and their subsequent differentiation into rod-like photoreceptors. These results indicate that purmorphamine has the potential to enhance the endogenous neurogenic capacity of Müller glial cells, making it a promising candidate for retinal regeneration therapies.

Reference: Mol Med Rep. 2017 Dec; 16(6): 7993–8002. https://pubmed.ncbi.nlm.nih.gov/28983586/

In vivo activity

Purmorphamine demonstrated neuroprotective activity in neonatal mice experiencing hypoxic-ischemic (HI) brain injury. PUR mitigated acute brain injury by reducing the Bax/Bcl-2 ratio and inhibiting caspase-3 activation. PUR reduced tissue loss and improved neurobehavioral outcomes up to 28 days post-HI injury. It enhanced the expression of synaptic markers and counters synaptic loss, potentially enhancing neural connectivity.

Reference: Front Pharmacol. 2020; 11: 204. https://pubmed.ncbi.nlm.nih.gov/32194421/

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.