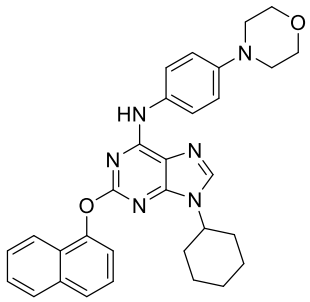
Product data sheet

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.

Product data sheet

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

The Müller glial cells were cultured for 2 days in the presence of different concentrations of SHH-N or purmorphamine, with or without cyclopamine. Compared with the untreated control cells, the percentage of PCNA-positive Müller glia increased significantly following treatment with the two SHH-N concentrations and the 0.5 mM purmorphamine treatment, whereas cyclopamine inhibited the production of PCNA-positive Müller glial cells compared with treatment with purmorphamine alone (representative immunostaining image are presented in Fig. 1B. These data indicated that the proliferation of Müller glial cells was promoted by purmorphamine treatment as well as SHH-N.

Reference: Mol Med Rep. 2017 Dec; 16(6): 7993–8002. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5779882/

In vivo activity

In the preliminary pilot study, this study tested the effects of PUR (Purmorphamine) at 1, 5, and 10 mg/kg upon infarct volumes and edema. PUR treatment at 5 and 10 mg/kg reduced infarct volumes ($p < 0.05$, $p < 0.001$, respectively), PUR treatment at 10 mg/kg reduced edema ($p < 0.001$), compared with those in the HI group at 72 h post-HI. From these studies, it was established that the 10 mg/kg dose exerted remarkable beneficial effects in the absence of any toxicity (data not shown). As shown in Figure 1A, HI insult led to a remarkable edematous condition and significantly increased the water content within the ipsilateral side at 72 h following HI. PUR treatment markedly reduced this HI-induced brain edema ($p < 0.001$) as compared with vehicle-HI mouse group.

Reference: Front Pharmacol. 2020; 11: 204. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7064623/